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SUPPLEMENT 153

SOUTHERN COOPERATIVE CORN DISEASE RESEARCH COMMITTEE

REPORT FOR 1944

February 1, 1945

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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SOUTHERN COOPERATIVE CORN DISEASE RESEARCH COMMITTEE

REPORT FOR 1944

J. Harvey McLaughlin, Chairman

Plant Disease Reporter
Supplement 153 February 1, 1945

The Southern Cooperative Corn Disease Research Committee successfully extended its corn seed treatment testing into the 1944 growing season. Seven cooperators located in 7 Southern States obtained data from 14 plantings of the recommended test.

The seed lots used in the 1944 tests were provided by the cooperators in Virginia, North Carolina, South Carolina, Mississippi, and Oklahoma. C. H. Arndt again conducted laboratory germination tests with samples from the different seed lots. The results of the germination tests and classification of seed-borne fungi are presented in Table 1. Arndt summarized his data as follows: The percentage of viable seeds in all lots was above 90. Two of the lots, Mississippi and Oklahoma, contained a relatively large percentage of seeds of low vitality, as was indicated by the percentage of partially germinating seeds. A possible explanation of the cause of these weak seeds would be of interest. The fungi secured from the seeds supplied no clue. The only important effect of treatment with $HgCl_2$ on germination was an 8% increase in normal seedlings for the Mississippi lot. The fungi carried by the seeds were much the same as for the lots used in 1943. All lots were heavily infested by Fusarium moniliforme, somewhat less so by Rhizopus spp., and still less by Penicillium spp.

A split-plot field design with varieties as main plots and treatments as subplots was used in all plantings of the tests. Each planting consisted of 5 varieties, 5 treatments and 5 replications. The chemicals[1] used for the treatment of seed were Semesan Jr., Spergon, Barbak C, and Dubay 1452-F. Chemicals were applied to the seed at the rate of 1-1/2 oz. of dust per bushel of corn seed. The seed were treated at the Oklahoma Station, packaged into envelopes of 100 seed each and distributed to the cooperators for planting.

Some of the environmental conditions and other information relative to each of the plantings are given in Table 2. A summarization of the mean seedling stand counts for each of the 14 plantings are presented in Table 3. Although the majority of significant and highly significant differences occurred in the South Carolina, Georgia, and Oklahoma plantings, the differences between nontreated and the various treatment means at the other locations were in favor of the treatments. Seed lots were highly significant in each and every test but one and were significant in that one.

In Table 4 are shown the mean total numbers of seedlings for each treatment for each test. From the totals for the 14 tests, calculated separately for each treatment, Semesan Jr. increased seedling emergence 5.21% over the nontreatment; Spergon, 5.51%; Barbak C, 5.95%; and Dubay 1452-F, 5.17%.

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[1]Chemicals supplied through the courtesy of the respective manufacturers.

Table 1. Data on germination and seed-borne fungi of the seed lots used in the 1944 cooperative corn seed treatment tests. Data obtained by C. H. Arndt of South Carolina

Source of seed	Variety	Treatment	Percent germination: Strong	Weak	Total	Percentage infested	Fungi present -- percent: Fusarium moniliforme	Fusarium species	Rhizopus species	Aspergillus species	Penicillium species	Cephalosporium species	Rhinotrichum species	Bombardia	Unidentified fungi	Bacteria
Okla.	Woods Corn	Non-treated[a]	74	15	89	100	87	--	35	3	5	--	--	--	--	--
		Treated[b]	77	14	91	20	10	--	--	11	--	--	--	--	--	1
Va.		Non-treated	96	2	98	100	96	--	5	9	12	2	--	--	--	--
		Treated	95	4	99	7	6	--	--	1	--	--	--	--	--	--
N. C.	Jarvis Golden Prolific	Non-treated	92	3	95	100	93	--	17	--	6	--	--	--	--	--
		Treated	96	1	97	37	35	--	--	--	--	1	--	1	--	--
S. C.	Hastings Prolific	Non-treated	90	4	94	100	87	--	21	5	11	--	3	--	2	--
		Treated	88	4	92	19	14	1	1	1	1	--	--	--	1	--
Miss.	Louisiana Hybrid #468	Non-treated	74	6	80	100	78	--	3	11	11	4	--	--	--	--
		Treated	82	9	91	57	45	--	--	3	5	3	--	--	2	--

[a] Data based on 100 nontreated seed of each lot held for 14 days at 20°C in individual tubes of water agar

[b] Data obtained as from nontreated seed. Prior to placing on water agar seed were immersed for 3 minutes in $HgCl_2$ in 50% ethanol (2.5 gm per liter) then rinsed in sterile water.

Table 2. Climatic and soil conditions relative to the various plantings of the 1944 corn seed treatment tests

Location	Planting date	Soil conditions: Type	pH	Moisture	Mean temperature[a]: Max.	Min.	Rainfall[b]	Cooperator
Lebanon, S. C.	IV- 7			Wet	23.9	10.9	2.68	C. H. Arndt
	V-11				32.0	15.2	.34	
Rocky Mount N. C.	IV-19	Norfolk fine sandy loam		Wet	24.4	10.4	.77	S. G. Lehman
Statesville N. C.	IV-21	Bladen fine sandy loam		Optimum	24.6	9.5	1.50	S. G. Lehman
Plymouth N. C.	IV-27	Bladen silt loam		Optimum	25.9	8.2	1.43	S. G. Lehman
State College, Miss.	V- 3	Trinity clay	6.6	Dry	25.4	13.0	2.82	G. Y. Young
	V-31	Trinity clay	6.6	Dry	32.5	19.3	None	
Blacksburg Va.	V- 4	Dunmore sandy loam	5.3	Dry	25.6	7.5	1.40	S. A. Wingard
	V-22		5.1		28.5	13.7	2.33	
Experiment Ga.	VI-15	Cecil sandy clay loam	6.1	Optimum	33.2	21.7	1.75	G. A. Lebedeff
Jackson Tenn.	V- 2			Wet	25.3	11.4	2.74	J. M. Epps
Stillwater Okla.	III-31	Sandy loam	5.2	Wet	22.3	6.3	1.76	J. H. McLaughlin
	IV- 6		6.1	Optimum	22.1	8.0	1.76	
	IV-18		5.1		21.3	9.5	2.92	

[a] (°F). Calculated for 12-day period following planting date of the respective test.

[b] (inches). Total precipitation during 12-day period following planting date.

Table 3. Summarization of data obtained from 14-corn seed treatment tests conducted in 7 Southern States in 1944.

Virginia, South Carolina, and North Carolina

		Virginia Blacksburg		South Carolina Lebanon		North Carolina Rocky Mt.	States-ville	Ply-mouth
Planting Date		V-4	V-22	IV-7	V-11	IV-19	IV-21	IV-27
Counting Date		V-30	VI-5	IV-28	VI-9	V-10	V-15	V-24
LSD[a] totals	.05		3.5	1.3	5.3	2.0		
	.01			1.8	7.0			
LSD[b] within	.05		7.8	3.0	11.8	4.5		
	.01			3.9	15.6			
Okla. seed lot means	SJ[c]	69.8	78.4*	81.4**	61.6**	85.2*	60.8	71.0
	Sp.	68.2	68.8	75.0**	42.0	85.4*	62.4	65.6
	Bar.	67.2	74.0	77.4**	70.6**	88.2*	55.8	65.4
	Dub.	68.2	71.4	81.0**	74.6**	80.8	63.2	68.2
	Nt.	69.2	57.4	67.0	41.2	78.2	54.6	63.2
Va. Seed lot means	SJ.	82.8	82.0	96.2**	71.2*	97.2	59.0	84.0
	Sp.	86.2	82.8	92.0	69.2	96.2	63.2	81.2
	Bar.	87.2	89.0	95.2*	81.2**	96.4	62.6	84.4
	Dub.	82.4	80.0	92.6	76.8**	96.2	56.0	83.6
	Nt.	81.2	83.2	91.8	58.0	95.2	63.6	83.6
N. C. seed lot means	SJ.	87.6	80.2	93.2**	78.8*	89.2	67.6	76.8
	Sp.	80.0	84.8	89.6	73.4	91.4	65.2	80.0
	Bar.	85.2	81.2	92.2**	81.8**	91.2	67.6	73.4
	Dub.	80.2	77.6	90.6*	77.4*	89.8	67.4	75.4
	Nt.	78.4	78.8	87.4	65.6	92.0	67.8	72.8
S. C. seed lot means	SJ.	79.8	85.6	93.6**	76.4**	92.8	57.8	74.2
	Sp.	80.2	85.8	79.4	70.8**	91.8	61.2	75.6
	Bar.	79.6	83.2	93.6**	72.4**	94.6	58.4	67.8
	Dub.	70.4	78.0	88.0**	75.4**	92.0	65.4	70.0
	Nt.	76.6	86.6	82.0	52.2	91.8	57.0	78.0
Miss. seed lot means	SJ.	70.4	70.6	82.8*	83.4**	84.2	45.8	69.6
	Sp.	71.6	67.8	83.6**	66.8	87.2	53.0	76.0
	Bar.	73.6	68.0	84.8**	82.4**	84.8	51.0	74.4
	Dub.	68.8	65.2	85.0**	72.8**	86.6	49.2	72.2
	Nt.	69.4	70.0	79.6	57.0	82.0	42.4	78.2
Mean totals for each test	SJ.	78.1	79.4	89.4**	74.3**	89.7	58.2	75.1
	Sp.	77.2	78.0	83.9**	64.4**	90.1*	61.0	75.7
	Bar.	78.6	79.1	88.6**	77.7**	91.0*	59.7	73.1
	Dub.	74.0	74.4	87.4**	75.4**	89.1	60.2	73.9
	Nt.	75.0	77.2	81.6	54.8	87.8	57.1	75.2

* Significant at .05 level
** Significant at .01 level
a LSD between treatments for test totals

(Table continued on opposite page)

Table 3. (Continued)

Tennessee, Georgia, Mississippi and Oklahoma

		Tennessee Jackson	Georgia Experiment	Mississippi State College		Oklahoma Stillwater		
Planting Date		V-2	VI-15	V-3	V-31	III-31	IV-6	IV-18
Counting Date		V-19	VII-5	V-29	VI-19	V-5	V-11	V-11
LSD[a]	.05		4.7		3.6	1.9	5.2	2.3
Totals	.01		6.3			2.5	7.0	3.0
LSD[b]	.05		10.5		8.0	4.2	11.7	5.0
within	.01		14.0			5.5	15.5	6.7
Okla.	SJ[c]	84.8	31.4	67.0	58.2	66.6*	54.8**	72.0**
seed	Sp.	87.4	28.4	61.0	59.4	66.8*	52.0**	74.2**
lot	Bar.	87.2	36.2	64.0	61.0	68.6**	46.4	64.4**
means	Dub.	88.2	47.4**	63.8	72.8*	70.0**	49.8*	71.6**
	Nt.	85.2	30.6	65.0	56.8	61.4	35.2	56.0
Va.	SJ.	95.2	63.0	82.4	76.8	92.6	73.6	94.8**
seed	Sp.	94.8	66.0	78.0	83.6	91.0	78.4	93.2*
lot	Bar.	94.4	61.6	77.4	78.0	93.6*	78.0	93.0*
means	Dub.	94.4	63.0	81.6	79.4	91.0	77.6	97.0**
	Nt.	93.8	58.2	82.2	80.0	89.0	77.6	86.8
N. C.	SJ.	91.2	57.0	78.0	76.4	89.4	68.8	90.6
seed	Sp.	89.8	56.2	82.0	81.8	93.4**	80.6	92.8*
lot	Bar.	96.0	56.2	78.6	80.4	91.6*	73.8	92.2
means	Dub.	89.8	47.6	75.6	79.0	89.0	77.5	92.2
	Nt.	92.2	57.0	79.4	79.4	86.8	70.6	87.4
S. C.	SJ.	91.6	42.0	74.0	75.8	91.4**	67.8	88.6
seed	Sp.	96.4	47.0	74.8	83.2	90.8**	75.4*	93.8*
lot	Bar.	94.4	49.0	74.2	76.0	90.6**	75.4*	90.2
means	Dub.	91.6	48.0	74.8	73.2	88.0	65.8	88.8
	Nt.	94.4	40.2	74.4	81.0	84.8	62.8	88.4
Miss.	SJ.	87.4	48.8**	63.4	71.2	81.4*	58.0	80.2
seed	Sp.	85.6	51.0**	69.0	74.0*	86.2**	67.0*	86.4*
lot	Bar.	86.6	52.6**	65.4	67.2	88.8	51.4	81.6
means	Dub.	91.0	49.0**	66.8	71.4	81.0	59.2	86.0*
	Nt.	88.0	29.4	72.4	72.8	77.2	53.2	79.8
Mean	SJ.	90.0	48.4*	73.0	71.7	84.3**	64.6	85.2**
totals	Sp.	90.8	49.7**	72.8	76.4*	85.6**	70.7**	88.1**
for	Bar.	91.7	51.1**	71.9	72.5	84.6**	65.0	84.2**
each	Dub.	91.0	51.0**	72.5	75.2	83.8**	66.0*	87.1**
test	Nt.	90.7	43.1	74.7	72.4	79.8	59.9	79.7

[b]LSD between treatments within seed lots.

[c]SJ=Semesan Jr., Sp=Spergon, Bar=Barbak C, Dub=Dubay 1452-F, Nt.=Nontreated.

The mean total numbers of seedlings, data of Table 4, were subjected to group analysis[2]; the results are shown in Table 5. The group analyses showed that in 8 of the 14 tests seed treatment with any one of the 4 chemicals gave highly significant seedling increases in comparison with the nontreated. Significance was not shown in 2 of the North Carolina plantings or in either of the 2 dates of planting in Virginia and Mississippi.

In Table 6 are given the relative values of the different chemicals in improving emergence of the different lots of corn seed. The total scores and rank of each chemical are given at the right of the table. It is apparent that the values for a given chemical vary from seed lot to seed lot but that in general chemicals rank higher than nontreated, and further, that chemicals tend to remain at a given rank for all seed lots. In Table 7 the relative values of the different chemicals are presented according to location of plantings. Spergon ranked first in Oklahoma; North Carolina, Mississippi and Tennessee; Semesan Jr. ranked first in Virginia and South Carolina; and Barbak C ranked first in Tennessee (tied with Spergon) and Georgia.

Isolations were made from corn seedling mesocotyls in South Carolina and Oklahoma. The following data show that isolations from seedlings produced from treated seed yielded fewer isolates of the common fungi than

Comparison of numbers of isolates of various organisms obtained from seedling mesocotyls in South Carolina and Oklahoma

Source of Data	Chemical Treatment	Total Number Isolations	Percentages of various fungi isolated			
			Fmo[a]	Fspp	Cac	Tspp
South Carolina	Nontreated	167	59	16	8	
planted IV-7-44	Spergon	80	75	13	5	1
isolated V-13-44	Mercury	139	25	45	4	3
South Carolina	Nontreated	80	76	10	7	5
planted V-11-44	Spergon	40	73	20	5	
isolations VI-18-44	Mercury	77	19	51		1
Oklahoma	Nontreated	30	53	3		20
planted IV-18-44	Spergon	60	32	15		22
isolations V-23-44	Semesan Jr.	80	26	11		18
	Barbak C	40	5	28		20
	Dubay 1452-F	40	8	25	2	23

[a] Fmo = Fusarium moniliforme; Fspp = Fusarium species; Cac = Cephalosporium acremonium; Tspp = Trichoderma species

did seedlings produced from nontreated seed. For instance, Fusarium moniliforme isolates were obtained more often from nontreatment than from treatments. Spergon does not appear to be as effective as the mercurials. The isolation data obtained this season agrees with and verifies the 1943 isolation results although the 1944 results are not so clear cut. Various other species of fungi were isolated but occurred so infrequently that they were omitted from the table.

[2] Roessler, E. B. and L. D. Leach. Analysis of combined seed treatment tests. Mimeographed paper from Division of Mathematics and Physics and Division of Plant Pathology, University of California, Davis.

Table 4. Mean total numbers of seedlings for each treatment for each test.

Location	Test No.	Mean total number of seedlings of each treatment: Semesan Jr.	Spergon	Barbak C	Dubay 1452-F	Non-treated	Data Significant
Lebanon, SC.	1	89.44	83.92	88.64	87.44	81.56	**
" "	2	74.28	64.44	77.68	75.40	54.80	**
Rocky Mount, NC.	3	89.72	90.12	91.04	89.08	87.84	*
Statesville, NC.	4	58.20	61.00	59.68	60.24	57.08	
Plymouth, NC.	5	75.12	75.68	73.08	73.88	75.16	
State College, Miss.	6	72.96	72.76	71.92	72.52	74.68	
" " "	7	71.68	76.40	72.52	75.16	72.40	*
Blacksburg, Va.	8	78.08	77.24	78.56	74.00	74.96	
" "	9	79.36	78.00	79.08	74.44	77.20	*
Experiment, Ga.	10	48.44	49.72	51.12	51.00	43.08	**
Jackson, Tenn.	11	90.04	90.80	91.72	91.00	90.72	
Stillwater, Okla.	12	84.28	85.64	84.64	83.80	79.84	**
" "	13	64.60	70.68	65.00	65.96	59.88	**
" "	14	85.24	88.08	84.24	87.12	79.68	**
Totals for all tests		1061.44	1064.48	1068.92	1061.04	1008.88	
Percentage increase for treatment over nontreatment		5.21	5.51	5.95	5.17	----	

*-significant at (.05) level
**-significant at (.01) level

Table 5. Summary of group analyses of the 1944 seedling stand data.

Group	No. of Locations	Semesan Jr.	Spergon	Barbak C	Dubay 1452-F	Non-treated	Mean error variance	Group F value	L S D (.05)	L S D (.01)
1	1[a]	89.44**	83.92**	88.64**	87.44**	81.56	5.52			
2	6[b]	72.57	73.51	72.47	71.71	71.91	41.13	.360		
3	3[c]	62.44**	61.61**	64.60**	64.12**	52.59	81.48	4.411	6.496	8.563
4	4[d]	87.32*	88.66**	87.91**	87.75**	84.52	13.37	3.788	2.274	2.995

[a]this test did not fit into any of the group analyses
[b]composed of tests No. 4,5,6,7,8 and 9
[c]composed of tests No. 2,10 and 13
[d]composed of tests No. 3,11,12 and 14
*-significant at (.05) level
**-significant at (.01) level

Table 6. Relative values of the different chemicals in improving emergence of the different lots of corn seed from all locations.

Seed lot	Chemical	Number of times a given chemical (column 2) was superior to					Total score[a]	Rank
		Semesan Jr.	Spergon	Barbak C	Dubay 1452-F	Nontreated		
Oklahoma seed Wood's Corn	Semesan Jr.		8	8	8	13	37	2
	Spergon	6		6	3	11	26	4
	Barbak C	6	8		3	12	29	3
	Dubay 1452-F	6	10	11		12	39	1
	Nontreated	1	3	2	2		8	5
Virginia seed	Semesan Jr.		8	6	9	10	33	2
	Spergon	6		7	7	10	30	3
	Barbak C	8	7		9	11	35	1
	Dubay 1452-F	4	5	4		8	21	4
	Nontreated	4	3	3	4		14	5
North Carolina seed Jarvis Golden Prolific	Semesan Jr.		6	4	10	7	27	2
	Spergon	8		8	9	10	35	1
	Dubay 1452-F	4	4	2		7	17	4
	Barbak C	9	5		11	10	35	1
	Nontreated	6	4	4	7		21	3
South Carolina seed Hastings Prolific	Semesan Jr.		4	5	9	9	27	3
	Spergon	10		9	8	10	37	1
	Barbak C	8	4		10	9	32	2
	Dubay 1452-F	4	5	4		9	22	4
	Nontreated	5	3	4	5		17	5
Mississippi seed Louisiana Hybrid #468	Semesan Jr.		3	6	4	11	24	4
	Spergon	11		8	11	10	40	1
	Barbak C	8	6		6	9	29	3
	Dubay 1452-F	10	3	8		10	31	2
	Nontreated	3	4	6	4		17	5
Totals for all seed lots combined	Semesan Jr.		29	29	40	50	148[b]	3
	Spergon	41		38	38	51	168	1
	Barbak C	39	30		39	52	160	2
	Dubay 1452-F	28	27	29		46	130	4
	Nontreated	19	17	19	22		77	5

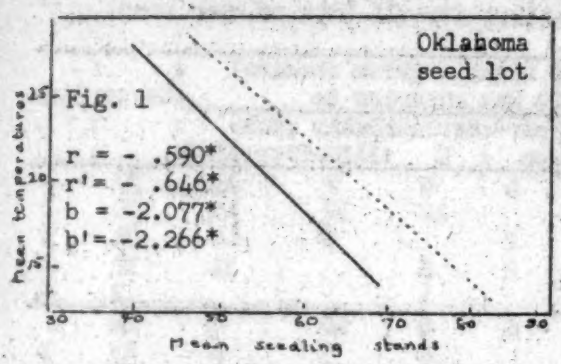
[a] Maximum score for any one chemical = 56
[b] Maximum total score for any one chemical = 280

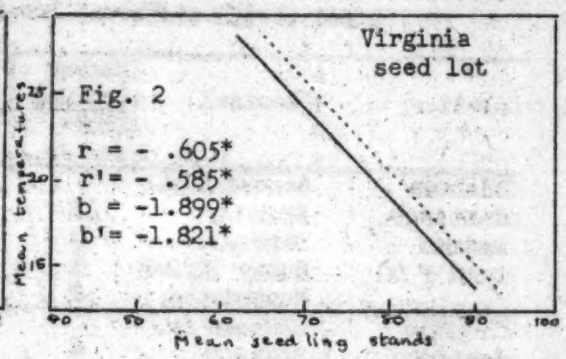
Yield data were obtained from the Rocky Mount and Statesville, North Carolina, plantings. Stands at each of these locations were thinned to approximately 35 plants per individual plot. At Rocky Mount, analysis of the thinned stand showed highly significant differences between replications and between seed lots but none for the different treatments. The yield data for this test also showed highly significant differences for treatments although the mean total yield for Semesan Jr. was significantly lower than the nontreated. At Statesville, analysis of the thinned stand showed nonsignificant differences for replications and seedlots and highly significant differences for treatments; however, these significant differences were small in magnitude. The yield data showed highly signi-

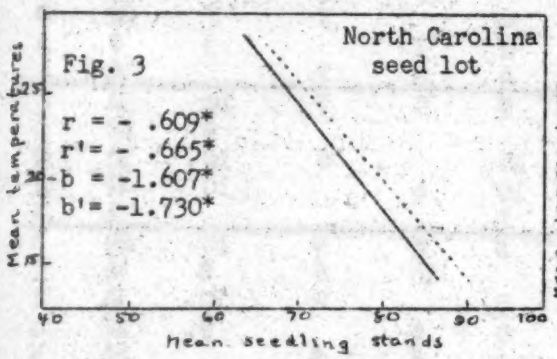
Table 7. Relative values of the different chemicals in improving emergence at the different locations for all lots of corn seed.

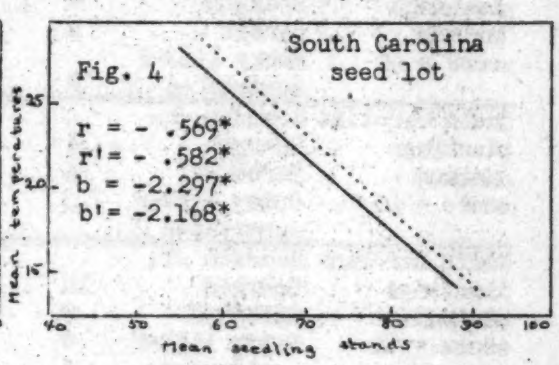
Location	Chemical	Number of times a given chemical (column 2) was superior to: Semesan Jr.	Spergon	Barbak C	Dubay 1452-F	Nontreated	Score	Rank
Oklahoma plantings Maximum score = 60	Semesan Jr.		4	6	7	13	30	4
	Spergon	11		12	12	15	50	1
	Barbak C	9	2		6	14	31	3
	Dubay 1452-F	8	2	8		14	32	2
	Nontreated	2		1			3	5
Virginia plantings Maximum score = 40	Semesan Jr.		4	6	10	8	28	1
	Spergon	6		4	7	6	23	3
	Barbak C	4	6		9	7	26	2
	Dubay 1452-F		2	1		3	6	5
	Nontreated	2	4	3	7		16	4
South Carolina plantings Maximum score = 40	Semesan Jr.		9	5	7	10	31	1
	Spergon	1				9	10	4
	Barbak C	4	10		6	10	30	2
	Dubay 1452-F	3	10	4		10	27	3
	Nontreated		1				1	5
North Carolina plantings Maximum score = 60	Semesan Jr.		5	5	9	10	29	3
	Spergon	10		10	8	8	36	1
	Barbak C	9	5		9	10	33	2
	Dubay 1452-F	6	6	6		9	27	4
	Nontreated	5	6	5	5		21	5
Mississippi plantings Maximum score = 40	Semesan Jr.		2	3	4	4	13	5
	Spergon	8		8	6	7	29	1
	Barbak C	7	2		4	3	16	4
	Dubay 1452-F	6	3	6		3	18	3
	Nontreated	6	3	7	7		23	2
Tennessee plantings Maximum score = 20	Semesan Jr.		3	2	2	1	8	3
	Spergon	2		3	2	3	10	1
	Barbak C	3	2		2	3	10	1
	Dubay 1452-F	2	2	2		3	9	2
	Nontreated	4	2	1	2		9	2
Georgia plantings Maximum score = 20	Semesan Jr.		2	2	1	4	9	4
	Spergon	3		1	3	3	10	3
	Barbak C	3	3		3	4	13	1
	Dubay 1452-F	3	2	2		4	11	2
	Nontreated		2	1	1		4	5

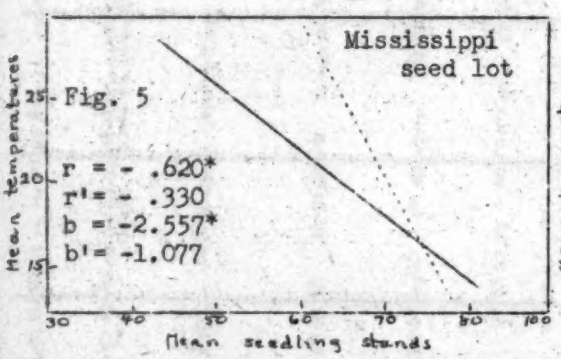
ficant differences between seed lots but none for either replications or treatments. The numbers of weak plants per plot were determined on May 10 (prior to thinning) at Rocky Mount. Analysis of the weak plant counts showed highly significant differences between seed lots but not for replications nor treatments. The Oklahoma seed produced the largest number of weak seedlings with the other seed lots in descending order as follows: South Carolina, Mississippi, North Carolina, and Virginia. The Oklahoma seed produced the highest yields followed by the Mississippi, North Carolina, South Carolina, and Virginia seed in that order.

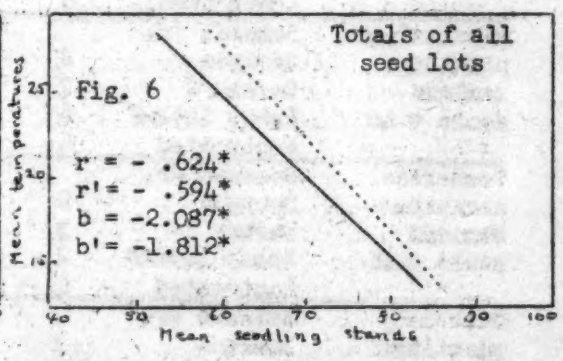












——— = regression line of seedling stands from nontreated seed.
..... = regression line of seedling stands from Semesan Jr. treated seed
r = correlation coefficient of stands from nontreated seed
r' = correlation coefficient of stands from Semesan Jr. treated seed
b = regression coefficient of stands from nontreated seed
b' = regression coefficient of stands from Semesan Jr. treated seed
* = significant at (.05) level

Figures 1-6. Relationships between mean air temperatures (°C) and seedling stands of the different seed lots.

Yield data were also obtained at the Oklahoma station. The seed in this test were spaced so that thinning would be unnecessary. After emergence, the irregularities in stand were eliminated by replanting. The replanted hills were mapped so that the plots could be harvested without including the yields from the plants resulting from the replanting. The replanting was done to eliminate the compensating effect of plants adjacent to missing hills so that the yield data obtained would be a direct result of the stands resulting from the original plantings. Analysis of the data showed significant differences between treatments, with Semesan Jr. and Barbak C mean total yields being significantly better than the nontreated mean total yields. Also yields from the Semesan Jr. treated plots in the Virginia seed lot were significant over the nontreated, and yields from the Barbak C treated Mississippi seed lot plots were significant over the nontreated. Correlation and regression studies of stands to yields indicated that the plant spacing used was too close for maximum yields, so that the benefits of increased stands resulting from seed treatment may have been obscured.

The relationships between the mean air temperatures of a 12-day period following the planting date and the resultant seedling stands for each seed lot and planting are shown in Figures 1 through 6 inclusive. A 12-day period following the planting date was used in calculating the mean air temperature figures and only the Semesan Jr. treatments vs. nontreatment so that the figures would be more nearly comparable to those of the 1943 season. Data from 13 of the 14 plantings (the April 6 planting at the Oklahoma station was omitted) were used in the calculations. The regression lines of stands against temperatures resulting from Semesan Jr. treated seed lie to the right of the regression lines of stands from nontreated seed. The divergence of the Mississippi seed lot may be atttributed to the quality of the seed. The seed in this lot were severely damaged by insect larvae and many others had cracked seed coats. All correlation and regression coefficients (except Semesan Jr. treatment in Mississippi seed lot) were significant, thus giving a measure of the validity of the comparisons. These data indicate that, in general, seed treatment was effective throughout the temperature range encountered and that smaller stands may be expected from later dates of planting. The 1944 data and the 1943 data are in close agreement. Similar calculations, substituting other chemicals for the Semesan Jr., would yield similar results.

Rates of application of chemicals tests were conducted at the Mississippi and Oklahoma stations. The chemicals used were Semesan Jr., Spergon, Barbak C, Dubay 1452-F, and Arasan. The rates of application were 2.5, 2.0, 1.5, and 1.0 ounces per bushel of seed. The seed was from the Mississippi seed lot. The data obtained at each of the locations are summarized in Table 8. The chemicals used showed nonsignificant mean differences between chemicals at each of the two locations; however, the various rates of application showed significant mean differences at both locations as indicated in the Table.

Also conducted at the Oklahoma station was a test giving comparisons of the chemical compound U.S. Rubber No. 604 at 2.0, 1.5, and 1.0 ounce applications per bushel of seed with nontreated seed. The seed used in this test was from the Oklahoma seed lot. Each of the three rates of application used resulted in highly significant mean differences between treatment and nontreatment in favor of the treatments, but there were no significant differences between rates of application of the chemical. Mean

Table 8. Summarization of the rates of application of chemical tests conducted at the Mississippi and Oklahoma Stations. Mississippi seed lot used for seed.

Location of test		College Station Mississippi	Stillwater Oklahoma
Date of planting		V-3-44	IV-6-44
Date of counting		V-29-44	V-11-44
LSD between rates for whole test	.05	3.56	3.16
	.01	4.72	4.19
LSD between rates within chemicals	.05	7.97	7.07
	.01	10.56	9.37
Semesan Jr. treatment	2.5 oz.	80.6	63.6
	2.0 oz.	80.2	62.6
	1.5 oz.	78.6	68.8*
	1.0 oz.	79.2	69.4*
	Nontreated	75.2	60.8
Spergon treatment	2.5 oz.	78.2	72.2**
	2.0 oz.	81.0	70.2*
	1.5 oz.	83.8*	73.4**
	1.0 oz.	76.8	73.2**
	Nontreated	75.6	61.4
Barbak C treatment	2.5 oz.	78.2	70.6**
	2.0 oz.	81.4*	68.0**
	1.5 oz.	78.2	69.4**
	1.0 oz.	79.6	72.4**
	Nontreated	73.0	58.2
Dubay 1452-F treatment	2.5 oz	83.2	72.4**
	2.0 oz.	76.6	70.2**
	1.5 oz.	77.6	65.4
	1.0 oz.	85.2	72.6**
	Nontreated	78.4	58.8
Arasan treatment	2.5 oz.	80.0	68.6**
	2.0 oz.	83.0*	70.6**
	1.5 oz.	80.8	63.4
	1.0 oz.	82.0*	66.0*
	Nontreated	74.2	58.8
Mean totals for rates	2.5 oz.	80.0*	69.52**
	2.0 oz.	80.4**	68.32**
	1.5 oz.	79.8*	68.08**
	1.0 oz.	80.6**	70.72**
	Nontreated	75.3	59.60

* Significant at .05 level
** Significant at .01 level

seedling stands for this test were: 2.0 ounce application, 71.8; 1.5 ounce application, 69.8; 1.0 ounce application, 70.2; and nontreated, 60.4.

Summarization of Results: Significant and highly significant increases in seedling stands were obtained in the South Carolina, Georgia, and Oklahoma plantings from seed treatment. Treatment means in a majority of the comparisons at all locations were greater than nontreatment means.

From the totals of the 14 tests conducted, seedling emergence was increased by Semesan Jr. 5.21% over the nontreatment; by Spergon 5.51%; by Barbak C, 5.95%; and by Dubay 1452-F, 5.17%.

Group analyses showed that in 8 of the 14 tests highly significant seedling stand increases resulted from treatment with any one of the 4 chemicals.

Isolation data showed that seedlings produced from treated seed yielded fewer isolates of the common fungi than seedlings from nontreated seed.

Yield data obtained from equally thinned stands showed no significant increases for treatments, whereas yield data obtained from space-planted stands showed significant increases for treatments.

Seed treatment resulted in increased seedling stands in late plantings as well as in early plantings.

In general, no significant differences were obtained in tests involving rates of application of the various chemicals.